SPANNING TREE WITH PROTOCOL FOR BYPASSING
PORT STATE TRANSITION TIMERS

ABSTRACT

[0055]   Mechanisms for use on designated ports in spanning tree protocol entities allow such ports to transition to a forwarding state on the basis of actual communication delays between neighboring bridges, rather than upon expiration of forwarding delay timers. The logic that manages transition of states in the spanning tree protocol entity identifies ports which are changing to a designated port role, and issues a message on such ports informing the downstream port that the issuing port is able to assume a forwarding state. The logic begins the standard delay timer for entry to the listening state and then the learning state, prior to assuming the forwarding state. However, when a reply from the downstream port is received, then the issuing port reacts by changing immediately to the forwarding state without continuing to await expiration of the delay timer and without traversing transitional listening and learning states. A downstream port which receives a message from an upstream port indicating that it is able to assume a forwarding state, reacts by ensuring that no loop will be formed by the change in state of the upstream port. In one embodiment, the downstream port changes the state of designated ports on the protocol entity which were recently root ports to a blocking state, and then issues messages downstream indicating that such designated ports are ready to resume the forwarding state. The designated ports on the downstream protocol entity await a reply from ports further downstream. In this way, loops are blocked step-by-step through the network, as the topology of the tree settles.